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EXAMINER	
WYATT, KEVIN S	

ART UNIT	PAPER NUMBER
2878	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/573,095	HAAS ET AL.	
	Examiner	Art Unit	
	Kevin Wyatt	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 22-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 22-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/30/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the Amendment after non-final and remarks filed on 02/12/2009. Currently, claims 1-15 and 22-32 are pending.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5, 15 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 5, 15 and 26, is not clear how an LED is a detector.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 3-5, 10, 14-15, 23 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Vriens (U.S. Patent No. 5,813,753).

Regarding claim 1, insofar as understood, Vriens shows Fig. 4, a radiation detector for detecting incident radiation according to a predetermined spectral sensitivity distribution (spectral sensitivity distribution of the semiconductor material packaged) having a sensitivity maximum at a predetermined wavelength λ_0, (wavelength range of the semiconductor materials used) radiation detector comprising at least one semiconductor chip (41, i.e., LED stack)(since the semiconductor chip of claim 26 is recited as an LED chip, the semiconductor chip of the above prior art having the same structural limitations may also be disclosed as an LED chip) and at least one optical filter (47, i.e., SWP filter), wherein the at least one semiconductor chip (41) comprises at least one III-V semiconductor material (AlGaAs, InGaAlP or GaN); the at least one optical filter (47) is disposed outside the at least one semiconductor chip (41), and the at least one optical filter is configured to receive the incident radiation, to absorb a portion of the incident radiation having a wavelength that is greater than the wavelength λ_0 of the sensitivity maximum, and to transmit filtered radiation to the at least one semiconductor chip (41)(col. 3, lines 50-54).

Regarding claim 3, insofar as understood, Vriens shows Figs. 4-5, a radiation detector comprising at least one semiconductor chip (41 or 51, i.e., LED stack)(since the semiconductor chip of claims 5 and 15 is recited as an LED chip, the semiconductor chip of the above prior art having the same structural limitations may also be disclosed as an LED chip) and operative to detect incident radiation according to a standard

spectral sensitivity distribution of the human eye (col. 3, lines 50-54), wherein the at least one semiconductor chip (41) contains at least one III-V semiconductor material (AlGaAs or InGaAlP).

Regarding claim 4, Vriens shows Figs. 4-5, further comprising at least one optical filter (SWP (47) or phosphor layer) that is disposed outside the at least one semiconductor chip (41 or 51), wherein the at least one and optical filter is configured to receive the incident radiation, to absorb a portion of the incident radiation having a wavelength that is greater than a wavelength λ_0' of a sensitivity maximum of the human eye (col. 3, lines 50-54), and transmit filtered radiation to the at least one semiconductor chip.

Regarding claims 5 and 26, Vriens discloses wherein the at least one semiconductor chip is an LED chip.

Regarding claim 10, Vriens discloses wherein the at least one optical filter comprises a plurality of filter particles (phosphor grains).

Regarding claim 14, Vriens discloses wherein the at least one III-V semiconductor material is $In_xGa_yAl_{1-x-y}P$, and wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$ and $x + y \leq 1$.

Regarding claim 23, Vriens shows Fig. 5, wherein the filter layer (phosphor layer) extends over an entire face of the at least one semiconductor chip (51).

Regarding claim 15, Vriens discloses wherein central emission wavelength of the LED chip is in an infrared region of the spectrum (uses a long wave pass filter (LWP) for the infrared portion of the spectrum).

7. Claims 1-4, 11-12, 23, 26, 25, 29-30 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Norton (U.S. Patent No. 5,373,182).

Regarding claim 1, Norton shows in Figs. 3-4 a radiation detector (1) for detecting incident radiation (visible, λ_1 or λ_2) according to a predetermined spectral sensitivity distribution (approx 0.3μm - 1.2μm) having a sensitivity maximum (maximum at least occurring in the visible or IR spectrum) at a predetermined wavelength $_0$, radiation detector comprising at least one semiconductor chip and at least one optical filter (bandpass filter stack (32), col. 6, lines 14-18), wherein the at least one semiconductor chip comprises at least one III-V semiconductor material (4, i.e., lattice-mismatch accommodation layer, col. 2, lines 20-22); the at least one optical filter is disposed outside the at least one semiconductor chip (1), and the at least one optical filter is configured to receive the incident radiation (visible, λ_1 or λ_2), to absorb a portion of the incident radiation having a wavelength that is greater than the wavelength $_0$ of the sensitivity maximum (attenuates cutoff portions of selected spectral regions), and to transmit filtered radiation to the at least one semiconductor chip.

Regarding claim 2, Norton discloses wherein the predetermined spectral sensitivity distribution is a standard sensitivity distribution of a human eye (col. 2, lines 4-7).

Regarding claim 3, Norton discloses a radiation detector (1) comprising at least one semiconductor chip and operative to detect incident radiation (visible) according to a standard spectral sensitivity distribution of the human eye (col. 2, lines 4-7), wherein

the at least one semiconductor chip contains at least one III-V semiconductor material (GaAs, col. 2, lines 20-22).

Regarding claim 4, Norton discloses further comprising at least one optical filter (bandpass filter stack) that is disposed outside the at least one semiconductor chip, wherein the at least one and optical filter (32) is configured to receive the incident radiation (visible, λ_1 or λ_2), to absorb a portion of the incident radiation having a wavelength that is greater than a wavelength λ_0' of a sensitivity maximum of the human eye, and transmit filtered radiation to the at least one semiconductor chip.

Regarding claim 11 and 29, Norton discloses wherein the at least one semiconductor chip comprises a filter layer (bandpass filter stack (32)).

Regarding claim 12 and 30, Norton discloses wherein filter layer absorbs radiation having a wavelength (wavelengths approaching cutoff at lower end of spectrum) that is smaller than λ_0'.

Regarding claim 25, Norton discloses wherein the radiation detector is configured for use as an environmental light sensor (for environments requiring detection in the infrared spectrum.

Regarding claim 32, Norton shows in Figs. 3-4 a radiation detector (1) for detecting incident radiation (visible, λ_1 or λ_2) according to a predetermined spectral sensitivity distribution (approx 0.3 m - 1.2 m) having a sensitivity maximum (maximum at least occurring in the visible or IR spectrum) at a predetermined wavelength λ_0, the detector comprising: at least one semiconductor chip comprising a filter layer (bandpass filter stack (32), col. 6, lines 14-18) and at least one III-V semiconductor material

(GaAs, col. 2, lines 20-22); and at least one optical filter disposed outside the at least one semiconductor chip, wherein the at least one optical filter is configured to receive the incident radiation(visible, λ_1 or λ_2), to absorb a portion of the incident radiation (visible, $_1$ or $_2$) having a wavelength that is greater than the wavelength λ_0 of the sensitivity maximum, and to transmit filtered radiation to the at least one semiconductor chip.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 6, 13-14, 22, 24, 27-28 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norton (U.S. Patent No. 5,373,182).

Regarding claims 6, 13, 22, 24 and 27-28, Norton discloses the claim invention as stated above. Norton does not disclose wherein a sensitivity distribution of the at least one semiconductor chip exhibits at least one maximum at a wavelength λ_1, and wherein a difference between λ_1 and λ_0 is 50 nm or less as recited in claims 6 and 27, wherein the radiation detector has a detector sensitivity such that at an arbitrary wavelength, a difference between corresponding values of the detector sensitivity and the standard spectral sensitivity distribution of the human eye is less than 40% as recited in claim 13, wherein the difference between corresponding values of the detector sensitivity and the standard spectral sensitivity distribution of the human eye is less than

25% as recited in claim 24, or the difference between λ_1 and λ_0 is 15 nm or less as recited in claims 22 and 28. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum "ranges, or measurements" involves only routine skill in the art. It would have been obvious to one skilled in the art to provide the tolerances recited above for the purpose of optimizing spectral bandwidth of radiation detector.

Regarding claims 14 and 30-31, Norton discloses the claimed invention as stated above. Norton does not explicitly disclose wherein the at least one III-V semiconductor material is $In_xGa_yAl_{1-x-y}P$, $In_xGa_yAl_{1-x-y}N$ or $In_xGa_yAl_{1-x-y}As$, with in each case and wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$ and $x + y \leq 1$ as recited in claim 14, or wherein the at least one III-V semiconductor material is $In_xGa_yAl_{1-x-y}P$, $In_xGa_yAl_{1-x-y}N$ or $In_xGa_yAl_{1-x-y}As$, and wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$ and $x + y \leq 1$ for the at least one semiconductor material as recited in claim 31. However, selecting a known, available "type of device, materials or methods" for detecting radiation of a particular wavelength requires only routine skill in the art. It would have been obvious to one skilled in the art to provide semiconductor materials as recited above for the purpose of detecting a desired spectral range.

10. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norton (U.S. Patent No. 5,373,182) in view of Manning (U.S. Patent No. 3,903,413).

Regarding claims 7-9, Norton discloses the claimed invention as stated above. In addition, Norton discloses further comprising at least one optical filter (bandpass filter stack) that is disposed outside the at least one semiconductor chip, wherein the at least one and optical filter (32) is configured to receive the incident radiation (visible, $_1$ or

$_2$), to absorb a portion of the incident radiation having a wavelength that is greater than a wavelength $_0$' of a sensitivity maximum of the human eye, and transmit filtered radiation to the at least one semiconductor chip in accordance with claim 9. Norton does not disclose wherein detector comprises an encapsulation that at least partially surrounds said the at least one semiconductor chip, wherein the encapsulation contains a resin, preferably a reaction resin as recited in claims 7-9. Manning shows in Fig. 2, wherein detector comprises an encapsulation that at least partially surrounds said the at least one semiconductor chip wherein the encapsulation contains a resin, preferably a reaction resin in accordance with claims 7-9. It would have been obvious to one skilled in the art to provide a detector such as disclosed in Manning to the device of Norton for the purpose of optimizing spectral response of detector.

Response to Arguments

10. Applicant's arguments, see pages, filed 02/12/2009, with respect to the rejection of claims 1-4, 11-13, 24-25, and 27-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Grunert (U.S. Patent No. 2005/0072908 A1) has been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

11. Applicant's remaining arguments filed 02/12/2009 have been fully considered but they are not persuasive.

In response to applicant's arguments regarding the 112 rejection of claims 5, 15 and 26, the examiner submits that the recited limitation in claim 1, "radiation detector comprising at least one semiconductor chip and at least one optical filter" would suggest that the means for detection is provided by the semiconductor chip because no other

elements are recited in claim 1. In claims 5, 15 and 26, applicant subsequently recites "the at least one semiconductor chip is an LED chip" which contradicts the scope of claims 1 and 3. One of ordinary skill in the art would not consider an LED chip (absent of any other recited limitations) as a detector. Applicant states on page 7 that claims 5, 15 and 26 are not indefinite because the "LED chips" recited in claims 5, 15 and 26 are not configured to emit light but to detect light. However, they are named LED chips based on their structure. Apart from the "semiconductor chip" limitation, nothing in claim 1 or claim 3 provides an indication or suggestion of a typical LED chip.

In response to applicant's arguments that Vriens does not disclose radiation detectors, that Vriens does not detect incident radiation according to a predetermined spectral sensitivity distribution, the examiner submits that Vriens discloses the structure of claim 1 and 3 including the III-V semiconductor material which by design of the material itself, structurally provides the means for detection according to the spectral range (UV/blue) of the particular III-V semiconductor material (GaN) despite being used in Vriens for light emission. In addition, applicant recites in claims 5, 15 and 26 an LED chip that according to claims 1 and 3 is a radiation detector, therefore the prior art disclosing all of the structural limitations of claims 1, 3, 5, 15 and 26 as understood, would also be considered an LED chip that is a radiation detector.

In response to applicant's arguments that Vriens does not disclose detecting radiation according to a standard spectral sensitivity distribution of the human eye, the examiner disagrees. As understood the semiconductor material (GaN) disclosed in

Vriens is operable in at least the spectral sensitivity range covering a portion of the blue spectrum.

In summary, Applicant's invention fails to structurally distinguish itself from the prior art. Applicant asserts that the prior art does not detect light. However, such feature is drawn to the use or function of the device and not its structure. Furthermore, Applicant clearly claims in claims 5 and 26 that the chip is an LED chip. It is unclear how Applicant's LED chip detects, yet the prior art's LED chip with the same claimed structure does not.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kim (U.S. Patent No. light emitting diode for use as an efficient emitter or detector of light at a common wavelength and method for forming the same.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Wyatt whose telephone number is (571)-272-5974. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571)-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin Wyatt/
Examiner, Art Unit 2878

/Georgia Y Epps/

Supervisory Patent Examiner, Art Unit 2878